

What is claimed is:

1. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:
- a recording track-designating section that designates at least one track for recording, from a plurality of tracks, as desired;
 - a reproducible track number-determining section that determines a number of tracks that can be reproduced, in response to the designation of the at least one track for recording; and
 - a reproducing track number-limiting section that limits a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.
2. A multi-track digital recording/reproducing apparatus according to claim 1, including a reproducing track-changing section that is capable of changing any of the tracks designated for reproduction, so long as the number of tracks designated for reproduction is equal to or smaller than the number of tracks that can be reproduced.
3. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:
- a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;
 - a plurality of external input terminals that are capable of receiving data from at least one external device;

a plurality of external output terminals that are capable of outputting data to at least one external device;

5 a plurality of mixer input channels that control characteristics of data inputted thereto and output the data;

10 a first selection section that causes the data inputted to said external input terminals to be selectively inputted to at least designated one of said mixer input channels;

a plurality of mixing buses that each mix data inputted thereto and output the mixed data;

15 a second selection section that causes the data outputted from the tracks of said multi-track recorder to be selectively inputted to at least designated one of said mixing buses;

20 a third selection section that causes the data outputted from said mixer input channels to be selectively inputted to at least designated one of said mixing buses;

25 a fourth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of said external output terminals as data to be outputted therefrom;

a fifth selection section that causes the mixed data outputted from each of said mixing buses to be selectively inputted to at least designated one of the tracks of said multi-track recorder;

30 a display section that displays in text format selection settings of said first selection section for selective input of the data inputted to said external input terminals to the at least designated one of said mixer input channels, and at the same time displays in
35 graphical representation selection settings of said third

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selection section for selective input of the data
outputted from said mixer input channels to the at least
designated one of said mixing buses and selection
settings of said fifth selection section for selective
5 input of the mixed data from each of said mixing buses to
the at least designated one of the tracks in a manner
following respective data transfer paths; and

a selection control section that changes the
selection settings of said first, third and fifth
10 selection sections and selection settings of said second
and fourth selection sections in response to user's
instructions.

4. A multi-track digital recording/reproducing
apparatus according to claim 3, including operating
15 elements that a user operates to give instructions to the
apparatus, and wherein said selection control section
changes the selection settings of said first selection
section according to user's operation of at least one of
the operating elements, and at the same time changes a
20 display in text format of the selection settings of said
first selection section on said display section, in
accordance with the changes in the selection settings of
said first selection section.

5. A multi-track digital recording/reproducing
25 apparatus according to claim 3, including operating
elements that a user operates to give instructions to the
apparatus, and wherein said selection control section
changes the selection settings of said third selection
section according to user's operation of at least one of
30 the operating elements, and at the same time changes a
display in graphical representation of the selection
settings of said third selection section on said display
section, in accordance with the changes in the selection
settings of said third selection section.

35 6. A multi-track digital recording/reproducing

one of said mixing buses, and a second setting display showing selection settings of said fourth selection section for selective input of the mixed data from each of said mixing buses to the at least designated one of the tracks of said multi-track recorder in an manner following respective data transfer paths; and

5 a selection control section that changes the selection settings of said second selection section in response to user's instructions, and at the same time changes the first setting display displayed on the display section in graphical representation, in accordance with the changes in the selection settings of said second selection section.

10 7. A multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, comprising:

a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;

20 a plurality of external input terminals that are capable of receiving data from at least one external device;

a plurality of external output terminals that are capable of outputting data to at least one external device;

25 a plurality of mixer input channels that control characteristics of data inputted thereto and output the data;

30 a first selection section that causes the data inputted to said external input terminals to be selectively inputted to at least designated one of said mixer input channels;

a plurality of mixing buses that each mix data inputted thereto and output the mixed data;

35 a second selection section that causes the data

outputted from said mixer input channels to be selectively inputted to at least designated one of said mixing buses;

a plurality of recorder input channels that receive
5 data from respective corresponding specific ones of the
tracks of said multi-track recorder, controls
characteristics of the data inputted thereto, and outputs
the data;

10 a third selection section that causes the data
outputted from the plurality of recorder input channels
to be selectively inputted to designated ones of said
mixing buses;

a fourth selection section that causes the mixed data outputted from each of said mixing buses to be
15 selectively inputted to at least designated one of said external output terminals as data to be outputted therefrom;

a fifth selection section that causes the mixed data
outputted from each of said mixing buses to be
20 selectively inputted to at least designated one of the
tracks of said multi-track recorder; and

a selection control section that changes selection settings of said first to fifth selection sections in response to user's instructions.

25 8. A multi-track digital recording/reproducing
apparatus for recording and reproducing digital audio
data by using multiple tracks, comprising:

a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks;

a plurality of external input terminals that are capable of receiving data from at least one external device;

a plurality of mixer input channels that control
35 characteristics of data inputted thereto and output the

data;

5 a first selection section that causes the data
inputted to said external input terminals to be
selectively inputted to at least designated one of said
mixer input channels;

a plurality of mixing buses that each mix data
inputted thereto and output the mixed data;

10 a second selection section that causes the data
outputted from each of the tracks of said multi-track
recorder to be selectively inputted to at least
designated one of said mixing buses;

15 a third selection section that causes the data
outputted from said mixer input channels to be
selectively inputted to at least designated one of said
mixing buses;

20 a fourth selection section that causes the data
outputted from the plurality of mixer input channels or
the mixed data outputted from said mixing buses to be
selectively inputted to at least designated one of the
tracks of said multi-track recorder;

25 a display section that displays a first setting
display showing selection settings of said first
selection section for selective input of the data
inputted to said external input terminals to the at least
designated one of said mixer input channels, a second
setting display showing selection settings of said fourth
selection section for selective input of the data from
said mixer input channels to the designated least one of
the tracks of said multi-track recorder, and an execution
30 button;

a display changing section that changes contents of
the first setting display and contents of the second
setting display, according to user's instructions; and

35 a selection control section that changes the
selection settings of said first selection section based

on the changed contents of the first setting display, and the selection settings of said fourth selection section based on the changed contents of the second setting display, in response to user's operation of the execution button.

9. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks,

the multi-track digital recording/reproducing method comprising the steps of:

designating at least one track for recording, from a plurality of tracks, as desired;

determining a number of tracks that can be reproduced, in response to the designation of the at least one track for recording; and

limiting a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.

10. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data

inputted thereto and output the mixed data,

the multi-track digital recording/reproducing method comprising the steps of:

- causing the data inputted to the external input
- 5 terminals to be selectively inputted to at least designated one of the mixer input channels;
- causing the data outputted from the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;
- 10 causing the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;
- causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least
- 15 designated one of the external output terminals as data to be outputted therefrom;
- causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;
- 20 displaying in text format selection settings for selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels, and at the same time displaying in graphical representation selection settings for selective
- 25 input of the data outputted from the mixer input channels to the at least designated one of the mixing buses, and selection settings for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks of the multi-track recorder, in a
- 30 manner following respective data transfer paths; and
- changing the selection settings for selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels, the selection settings for selective input of the data
- 35 outputted from the mixer input channels to the at least

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designated one of the mixing buses, the selection settings for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks of the multi-track recorder, selection settings
5 for selective input of the data outputted from the tracks of the multi-track recorder to the at least designated one of the mixing buses, and selection settings for selective input of the mixed data outputted from each of the mixing buses to the at least designated one of the
10 external output terminals, in response to user's instructions.

11. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio
15 data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external output terminals that are capable of outputting data to at least one external
20 device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,

the multi-track digital recording/reproducing method
25 comprising the steps of:

causing the data outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;

causing the data outputted from the mixer input
30 channels to be selectively inputted to at least designated one of the mixing buses;

causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data
35 to be outputted therefrom;

causing the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

displaying in graphical representation, concerning
5 the mixer input channels, a first setting display showing selection settings for selective input of the data from the mixer input channels to the at least designated one of the mixing buses, and a second setting display showing selection settings for selective input of the mixed data
10 from each of the mixing buses to the at least designated one of the tracks, in an manner following respective data transfer paths; and

changing the selection settings for selective input of the data from the mixer input channels to the at least
15 designated one of the mixing buses in response to user's instructions, and at the same time changes the first setting display displayed in graphical representation, in accordance with the changes in the selection settings.

12. A multi-track digital recording/reproducing
20 method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of
25 tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control
30 characteristics of data inputted thereto and output the data, a plurality of mixing buses that each mix data inputted thereto and output the mixed data, and a plurality of recorder input channels that receive data from respective corresponding specific ones of the tracks
35 of the multi-track recorder, controls characteristics of

the data inputted thereto, and outputs the data,
the multi-track digital recording/reproducing method
comprising the steps of:

- causing the data inputted to the external input
5 terminals to be selectively inputted to at least
designated one of the mixer input channels;
causing the data outputted from the mixer input
channels to be selectively inputted to at least
designated one of the mixing buses;
10 causing the data outputted from the plurality of
recorder input channels to be selectively inputted to
designated ones of the mixing buses;
causing the mixed data outputted from each of the
mixing buses to be selectively inputted to at least
15 designated one of the external output terminals as data
to be outputted therefrom;
causing the mixed data outputted from each of the
mixing buses to be selectively inputted to at least
designated one of the tracks of the multi-track recorder;
20 and
changing, in response to user's instructions,
selection sections for selective input of the data
inputted to the external input terminals to the at least
designated one of the mixer input channels, selection
25 sections for selective input of the data outputted from
the mixer input channels to the at least designated one
of the mixing buses, selection sections for selective
input of the data outputted from the plurality of
recorder input channels to the designated ones of the
30 mixing buses, selection sections for selective input of
the mixed data outputted from each of the mixing buses to
the at least designated one of the external output
terminals, and selection sections for selective input of
the mixed data outputted from each of the mixing buses to
35 the at least designated one of the tracks of the multi-

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track recorder.

13. A multi-track digital recording/reproducing method using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,
- the multi-track digital recording/reproducing method comprising the steps of:
- causing the data inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;
 - causing the data outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;
 - causing the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;
 - causing the data outputted from the plurality of mixer input channels or the mixed data outputted from the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;
 - displaying a first setting display showing selection settings for selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels, a second setting display showing selection settings for selective input of the data from the mixer input channels to the designated least one of the tracks of the multi-track recorder, and

an execution button;

changing contents of the first setting display and contents of the second setting display, according to user's instructions; and

5 changing the selection settings for the selective input of the data inputted to the external input terminals to the at least designated one of the mixer input channels based on the changed contents of the first setting display, and the selection settings for the
10 selective input of the data from the mixer input channels to the designated least one of the tracks of the multi-track recorder based on the changed contents of the second setting display, in response to user's operation of the execution button.

15 14. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the program comprising:

20 a recording track-designating module that designates at least one track for recording, from a plurality of tracks, as desired;

a reproducible track number-determining module that determines a number of tracks that can be reproduced, in
25 response to the designation of the at least one track for recording; and

a reproducing track number-limiting module that limits a number of tracks for reproduction to the number of tracks that can be reproduced, by automatically muting
30 at least predetermined one of tracks designated for reproduction, when the number of tracks designated for reproduction is larger than the number of tracks that can be reproduced.

35 15. A recording/reproducing program executed by a computer, the program using a multi-track digital

recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data

5 on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at least one external device, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels

10 that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data, the program comprising:

a first selection module that causes the data

15 inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;

a second selection module that causes the data outputted from the tracks of the multi-track recorder to

20 be selectively inputted to at least designated one of the mixing buses;

a third selection module that causes the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;

25 a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data to be outputted therefrom;

a fifth selection module that causes the mixed data

30 outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

a display module that displays in text format selection settings by the first selection module for

35 selective input of the data inputted to the external

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input terminals to the at least designated one of the mixer input channels, and at the same time displays in graphical representation selection settings by the third selection module for selective input of the data

5 outputted from the mixer input channels to the at least designated one of the mixing buses, and selection settings by the fifth selection module for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks, in a manner
10 following respective data transfer paths; and

 a selection settings-changing module that changes the selection settings by said first, third and fifth selection modules, and selection settings by said second and fourth selection modules in response to user's
15 instructions.

 16. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and reproducing digital audio data by using multiple tracks,
20 the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external output terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels
25 that control characteristics of data inputted thereto and output the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data, the program comprising:

 a first selection module that causes the data
30 outputted from each of the tracks of the multi-track recorder to be selectively inputted to at least designated one of the mixing buses;

 a second selection module that causes the data
outputted from the mixer input channels to be selectively
35 inputted to at least designated one of the mixing buses;

a third selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external output terminals as data to be outputted therefrom;

5 a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder;

10 a display module that displays in graphical representation, concerning the mixer input channels, a first setting display showing selection settings by said second selection module for selective input of the data from the mixer input channels to the at least designated one of the mixing buses, and a second setting display
15 showing selection settings by said fourth selection module for selective input of the mixed data from each of the mixing buses to the at least designated one of the tracks of the multi-track recorder, in a manner following respective data transfer paths; and

20 a selection settings-changing module that changes the selection settings by said second selection module in response to user's instructions, and at the same time changes the first setting display displayed by said display module in graphical representation, in accordance
25 with the changes in the selection settings by said second selection module.

17. A recording/reproducing program executed by a computer, the program using a multi-track digital recording/reproducing apparatus for recording and
30 reproducing digital audio data by using multiple tracks, the apparatus including a multi-track recorder that is capable of performing recording and reproduction of data on a plurality of tracks, a plurality of external input terminals that are capable of receiving data from at
35 least one external device, a plurality of external output

terminals that are capable of outputting data to at least one external device, a plurality of mixer input channels that control characteristics of data inputted thereto and output the data, a plurality of recorder input channels
5 that receive data from respective corresponding specific ones of the tracks of the multi-track recorder, controls characteristics of the data inputted thereto, and outputs the data, and a plurality of mixing buses that each mix data inputted thereto and output the mixed data,

10 the program comprising:

a first selection module that causes the data inputted to the external input terminals to be selectively inputted to at least designated one of the mixer input channels;

15 a second selection module that causes the data outputted from the mixer input channels to be selectively inputted to at least designated one of the mixing buses;

a third selection module that causes the data outputted from the plurality of recorder input channels
20 to be selectively inputted to designated ones of the mixing buses;

a fourth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the external
25 output terminals as data to be outputted therefrom;

a fifth selection module that causes the mixed data outputted from each of the mixing buses to be selectively inputted to at least designated one of the tracks of the multi-track recorder; and

30 a selection settings-changing module that changes selection settings by said first to fifth selection modules in response to user's instructions.

18. A recording/reproducing program executed by a computer, the program using a multi-track digital
35 recording/reproducing apparatus for recording and

reproducing digital audio data by using multiple tracks,
the apparatus including a multi-track recorder that is
capable of performing recording and reproduction of data
on a plurality of tracks, a plurality of external input
5 terminals that are capable of receiving data from at
least one external device, a plurality of mixer input
channels that control characteristics of data inputted
thereto and output the data, and a plurality of mixing
buses that each mix data inputted thereto and output the
10 mixed data,
the program comprising:
a first selection module that causes the data
inputted to the external input terminals to be
selectively inputted to at least designated one of the
15 mixer input channels;
a second selection module that causes the data
outputted from each of the tracks of the multi-track
recorder to be selectively inputted to at least
designated one of the mixing buses;
20 a third selection module that causes the data
outputted from the mixer input channels to be selectively
inputted to at least designated one of the mixing buses;
a fourth selection module that causes the data
outputted from the plurality of mixer input channels or
25 the mixed data outputted from the mixing buses to be
selectively inputted to at least designated one of the
tracks of the multi-track recorder;
a display module that displays a first setting
display showing selection settings by said first
30 selection module for selective input of the data inputted
to the external input terminals to the at least
designated one of the mixer input channels, a second
setting display showing selection settings by said fourth
selection module for selective input of the data from the
35 mixer input channels to the designated least one of the

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tracks of the multi-track recorder, and an execution button;

5 a display changing module that changes contents of the first setting display and contents of the second setting display, according to user's instructions; and

10 a selection settings-changing module that changes the selection settings by said first selection module based on the changed contents of the first setting display, and the selection settings by said fourth selection module based on the changed contents of the second setting display, in response to user's operation of the execution button.

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